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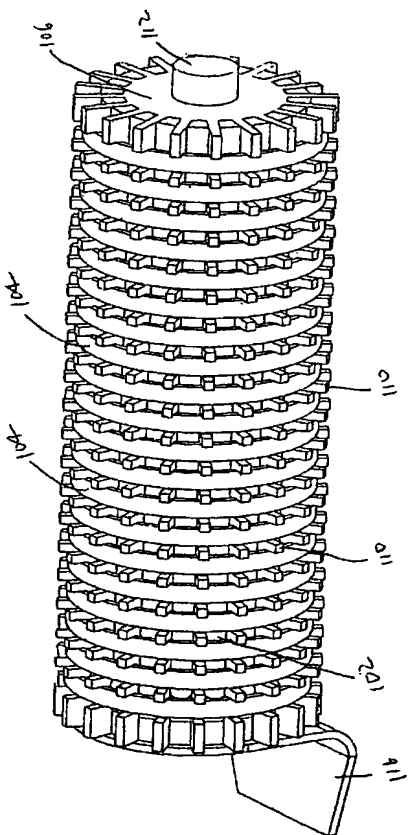
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[Continued on next page]

(54) Title: HINGE CONNECTOR FOR ELECTRONIC DEVICES



(57) Abstract: A hinge for an electronic device, such as a notebook computer, a personal digital assistant, a cellular telephone, a portable compact disc player and the like, includes a body member and at least one contact provided on the body member. Structure is provided for electrically connecting each contact to a first portion of the electronic device. Structure is also provided for connecting each contact to a second portion of the electronic device. The hinge can be repeatedly used without wear or rubbing action because the ends of the contacts always remain connected to the electrical components of the upper and lower portions of the electronic device. If damaged, only the hinge needs to be replaced and the connections to the electronic device reinstated.

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INTERNATIONAL SEARCH REPORT

In **nal Application No**

PCT/US 03/15298

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 H01R35/00 H01R39/64

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 IPC 7 H01R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EP0-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 865 553 A (TANIGAWA JUNICHI ET AL) 12 September 1989 (1989-09-12)	1,2,19, 20,23, 27,28
A	column 2, line 28 - line 61; figures 1-7 ---	24-26
X	US 6 272 324 B1 (HAYES GERARD J ET AL) 7 August 2001 (2001-08-07) column 4, line 66 - column 5, line 7 column 6, line 50 - line 63; figures 5-8 ---	1,2, 17-19, 21,22
X	US 5 278 993 A (STANTON STEPHEN M ET AL) 11 January 1994 (1994-01-11) column 2, line 53 - line 64; figures 1,2,4 ---	1,2,17, 19,21,27
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

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- *&* document member of the same patent family

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International Application No
PCT/US 03/15298

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 860 312 A (GORDON JR FRANK) 14 January 1975 (1975-01-14) column 3, line 43 -column 4, line 4; figure 1	1-4,27
X	"CONNECTOR/HINGE FOR LAPTOP COMPUTER LIQUID CRYSTAL DISPLAY" IBM TECHNICAL DISCLOSURE BULLETIN, IBM CORP. NEW YORK, US, vol. 34, no. 9, 1 February 1992 (1992-02-01), pages 29-32, XP000300585 ISSN: 0018-8689	1,2
A	the whole document	6
X	EP 1 147 783 A (AD TECH MEDICAL INSTR CORP) 24 October 2001 (2001-10-24)	1,2
A	column 6, line 16 - line 28; figures 1-7	5-7,10
X	US 4 764 121 A (DITZIG ALBERT) 16 August 1988 (1988-08-16)	1-4
A	column 5, line 1 - line 46; figures 1-24	30
X	US 4 854 881 A (DITZIG ALBERT) 8 August 1989 (1989-08-08)	1-4
A	column 4, line 27 - line 30; figure 2A	30
A	GB 2 073 961 A (PETRI AG) 21 October 1981 (1981-10-21) page 2, line 22 - line 36; figures 1-3	30

INTERNATIONAL SEARCH REPORT

national application No.
PCT/US 03/15298

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
1-28, 30-35
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-5,17-28

Hinge with rib between conductive surfaces

2. Claims: 6-16

Hinge with conductive surface formed from a row and a column which are connected to each other

3. Claim : 29

hinge with body member formed from two halves which form a cylinder when assembled

4. Claims: 30-35

Hinge with a coiled spring

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 03/15298

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4865553	A	12-09-1989	JP 1150390 U	18-10-1989
US 6272324	B1	07-08-2001	NONE	
US 5278993	A	11-01-1994	NONE	
US 3860312	A	14-01-1975	NONE	
EP 1147783	A	24-10-2001	US 6415168 B1 EP 1147783 A2 US 2002095079 A1	02-07-2002 24-10-2001 18-07-2002
US 4764121	A	16-08-1988	US 4673228 A CA 1284525 C DE 3887360 D1 DE 3887360 T2 EP 0280947 A2 JP 1913256 C JP 6034361 B JP 63228577 A US 4854881 A CA 1261014 A1 DE 3689999 D1 DE 3689999 T2 EP 0227390 A2 JP 1618255 C JP 2041151 B JP 62154483 A	16-06-1987 28-05-1991 10-03-1994 18-08-1994 07-09-1988 09-03-1995 02-05-1994 22-09-1988 08-08-1989 26-09-1989 01-09-1994 24-11-1994 01-07-1987 12-09-1991 14-09-1990 09-07-1987
US 4854881	A	08-08-1989	US 4764121 A US 4673228 A CA 1284525 C DE 3887360 D1 DE 3887360 T2 EP 0280947 A2 JP 1913256 C JP 6034361 B JP 63228577 A CA 1261014 A1 DE 3689999 D1 DE 3689999 T2 EP 0227390 A2 JP 1618255 C JP 2041151 B JP 62154483 A	16-08-1988 16-06-1987 28-05-1991 10-03-1994 18-08-1994 07-09-1988 09-03-1995 02-05-1994 22-09-1988 26-09-1989 01-09-1994 24-11-1994 01-07-1987 12-09-1991 14-09-1990 09-07-1987
GB 2073961	A	21-10-1981	DE 3009109 A1 BR 8100771 A FR 2477789 A1 JP 1360581 C JP 56138886 A JP 60041834 B	17-09-1981 15-09-1981 11-09-1981 30-01-1987 29-10-1981 19-09-1985